

## CLAIMS

What is claimed is:

1           1.     A pressure sensor, comprising:

2               a support;

3               a membrane having first and second opposing sides and a radially  
4 peripheral edge region, said membrane being made of an electrical conducting metal,  
5 said radially peripheral edge region being fixed relative to said support, and one of said  
6 first and second opposing sides being arranged for facing a medium such that the  
7 membrane is deflective relative to the pressure of the medium;

8               an insulating layer having a first side and a second side, wherein said first  
9 side of said insulating layer is arranged on said membrane; and

10              measuring elements and an electric circuit interconnecting said measuring  
11 elements being applied on said second side of said insulating layer by a thick-film  
12 technique and sintered onto said second side by a thermal process, said measuring  
13 elements and said electric circuit being arranged for determining the pressure of the  
14 medium, said insulating layer consisting of a material having a coefficient of expansion  
15 that lies between the coefficient of expansion of said metal of said membrane and the  
16 coefficient of expansion of said measuring elements and said electric circuit.

1           2.     The pressure sensor of claim 1, wherein said electric circuit  
2 interconnecting said measuring elements forms a Wheatstone measuring bridge.

1                   3.     The pressure sensor of claim 2, wherein said measuring elements  
2     are strain gages.

1                   4.     The pressure sensor of claim 1, wherein said insulating layer  
2     comprises a plurality of layers lying one on top of the other arranged on said membrane,  
3     wherein the one of said plural layers lying furthest away from said membrane bears said  
4     measuring elements and said electric circuit, wherein each of said plural layers has a  
5     coefficient of expansion which lies between the coefficient of expansion of said metal of  
6     said membrane and the coefficient of expansion of said measuring elements and said  
7     electric circuit.

1                   5.     The pressure sensor of claim 4, wherein the coefficients of  
2     expansion of the materials of said plural layers are such that they increase in stages,  
3     and the one of said plural layers closest to said membrane has a coefficient of  
4     expansion closer to that of said membrane than the coefficient of expansion of others of  
5     said layers that are further away from said membrane.

1                   6.     The pressure sensor of claim 4, wherein the coefficients of  
2     expansion of at least some of said plural layers are equal.

1                   7.     The pressure sensor of claim 1, wherein said membrane comprises  
2     a stainless steel membrane.

1                   8.     The pressure sensor of claim 7, wherein said stainless steel  
2     membrane comprises a stainless steel sheet having a thickness of approximately 0.1  
3     mm to 0.6 mm.

1                   9.     The pressure sensor of claim 4, wherein each of said plural layers  
2     consists of a dielectric paste printed onto said membrane or a lower one of said plural  
3     layers and is fired in a thermal process.

1                   10.    The pressure sensor of claim 1, wherein said insulating layer  
2     consists of a dielectric paste printed onto said membrane and fired in a thermal process.

1                   11.    The pressure sensor of claim 9, wherein at least two of said electric  
2     circuit, said measuring elements, and one of said plural layers are fired in a joint thermal  
3     process.

1                   12.    The pressure sensor of claim 10, wherein at least two of said  
2     electric circuit, said measuring elements, and said insulating layer are fired in a joint  
3     thermal process.

1                   13.    The pressure sensor of claim 1, further comprising one of electrical  
2     and electronic components of an evaluation unit connected to said electric circuit and  
3     arranged on the side of said membrane bearing said measuring elements and said  
4     electric circuit.

1                   14.    The pressure sensor of claim 13, wherein said evaluation circuit  
2 includes electronic integrated circuits.

1                   15.    The pressure sensor of claim 13, wherein said evaluation circuit  
2 has electronic components designed as surface mount device components.

1                   16.    The pressure sensor of claim 1, wherein said radially peripheral  
2 edge region of said membrane is welded to said support.

1                   17.    The pressure sensor of claim 16, wherein said support comprises  
2 a sleeve, said membrane and said sleeve forming a pressure cell.

1                   18.    The pressure sensor of claim 17, wherein said pressure cell  
2 comprises a thread on one of an inner and outer cylindrical surface.